

SEQUENCE LISTING**SEQ ID NO: 1 (*Haemophilus aegyptius*)**

MKRNLKQSVIAVLIGGTTVSNYALAAQAQAQVKKDELSELKKQVKEMDAAIDGILDDNIAEAEVDAKLDQHSAAALGRHTNRLNNL
KTIAEKAKGDSSEALDKIEALEEQNDEFLADITALEEGVDGLDDDIAGIQDNISDIEDDINQNSADIATNTAAIATHQRLDNLDNRV
NNLNKDLKRLAQAALNGLFQPYNVGKLNLTAAVGGYKSQTAVAVG

SEQ ID NO: 2 (*Escherichia coli*)

MKTVNVALLALIISATSSPVVLAGDTIEAAATELSAINSGMSQSEIEQKITRFLERTDNSPAAYTYLTHEHHYIPSETPDTTQTPTVQT
DPDAGQKTVAATGDVQTTARYQSMINARQSAVTDAAQTQITEQQAQIVATQKTLAATGDTQNTAHYQEMINARLAAQNEANQRTATEQ
GQKMNALTTDVAVQQQONERTQYDKQMQLAQESAQAHEQIDSLSQDVTQTHQQLTNTQKRVADNSQQINTLNNHFSSLKNEVDDNRKE
ANAGTASAIASQPQVKTGDVMMVSAGAGTFNGESAVSVGTSFNAGTHTVLKAGISADTQSDFGAGVGVGYSF

SEQ ID NO: 3 (*EHEC*)

MNKIFKVIWNPATGNYTIVTSETAKSRGKSGRSKLLISALVAGGMLSSFGALANAGNDNGQGVYDYGSGSAGDGWVAIGKGAkantFMNTSGSSTAVG
YDAIAEGQYSSAIGSKTHAIGGASMAFGVSAISEGDRSIALGASSYSLGQYSMALGRYSKALGKLSIAMGDSKKAEGANAIAGNATKATEIMSIAL
GDTANASKAYSMALGASSVASEENAIAGAETEAENATAIGNNAKAGTNSMAMGFGSLADKVNIALGNGSQALADNAIAGQGNKADGVDAIAL
GNGSQSRGLNTIALGTASNATGDKSLALGSSSANGINSVALGADSIADLDNTVSVGNSSSLKRKIVNVKNGAIKSDSYDAINGSQLYAISDSVAKRL
GGGAADVDDGTVTAPTNYLKNKSKNNVGAALAVLDENTLQWDQTKGKYSAAHGTSSTASVITDVADGTISASSKDAVNGSQLKATNDDVEANTAN
IATNTSNIATNTANIATNTTITNLTDVSGDLQADALLWNETKKAFSAAHGQDTSKITNVKDADLTADSTDAVNGSQLKTTNDAVATNTTNIANTNT
SNIATNTTNI SNLTETVTNLGEDALKWDKNGVFTAAHGTEFTSKITNVKDGDLTTGSTDAVNGSQLKTTNDAVATNTTNIATNTTNI SNLTETVTN
LGEDALKWDKNGVFTAAHGNTASKITNILDGTVTATSSDAINGSQLYDLSSNIATYFGGNASVNTDGVFTGPTYKIGETNYNVGDALAAINSSSF
STSLGDALLWDATAGKFSAKHGTNGDASVITDVADGEISDSSDAVNGSQLHGVSSYVVDALGGGAENVADGTITAPTYTIANADYDNVGDALNAID
TTLDDALLWDADAGENGAFSAAHGDKTASVITNVANGAISASSDAINGSQLYTTNKYIADALGGDAENVADGTITAPTYTIANAEYNNVGDALDA
LDDNALLWDETANGAGAYNASHDGKASIIITNVANGSISEDSTDAVNGSQLNATNMIEQNTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFN
DASAQGVGATAIGYNSVAKGDSSVAIGQGSYSVDVTGIALGSSSVSSRVIAKGRDTSITENGVIYDITDGEELLGALSIGDDGKYRQIINVADGS
EAHDAVTVRQLQNAIGAVATTPTKYFANSTEEDSLAVGTDLSLAMAKTIVNGDKGIGIGYGAYVDANALNGIAIGSNAQVIHVSIAIGNGSTTTR
GAQNTYATYNDAPQNSVGEFSVGSADGQRQITNVAGSADTDVNVGQLKVTDAQVSQNTQSIITNLDNRVTNLDNRVTNIENGIGDIVTTGSTKYF
KTNTDGVDAQAQKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRITNVAGKNATDAVNVAQLKSSEAGGVRYDTKADGSIDYSNI
TLGGGNGGTTRI SNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVA
LGVMVSANGRWVYKLQGSTNSQGEYSALGAGIQW

5 SEQ ID NO: 4 (*Actinobacillus actinomycetemcomitans*)

MTYQLFKHHLVALMVTGAISVNALAKDSFLENPSANLPQQVFKNRVDIFNNETNINENKKDIAINKANIASIEKDVMRNTGGIDRLAK
QELVNRARITKNELDIRKNTKSIAENTASIARIDGNLEGVNRVLQNVDRSTENAAARSANEQKIAENKKAIEKADKADVEKNRADI
AANSRAIATFRSSSQNIAALTTKVDNRNTARIDRLDSRVNELDKVEKNGLASQAALSGLFQPYNVGSLNLSAAVGGYKSKTALAVGSGY
RFNQNVAAKAGVAVSTNGGSATYNVGLNFEW

SEQ ID NO: 5 (*Haemophilus somnus*)

MKKVQFFKYSSLALALGLGVSASALAAPTSTSTTTGPEAPPTGPAPTAKDPLAETALAYDLENEVAYLRMKAGEWMQLGLDPEKEVIK
GWNEVKSLPRIDGNGKDKQTKDQIAMLI RTVDNTKELGRIVSTNIEDIKNLKKELYGFVEDVNESEARNISRIDENEKDIKNLKKELY
DFVEDVNESEARNISRIDENEKDIKNLKKELYGFVEDVNESEARNISRIDENEKDIKNLKKELYGFVEDVNESEARNISRIDENEKDIKNLKKELY
DANKQETEDDIADNAKAIHSNTKGIKNTKDIRDLDTKTKQMLENDKNLMTGLESLATETSKGFERFDVKTQQLDQAVANVGRVDIT
EQAIRQNTAGLVNVNKRVDITDKNTKAGIASAVALGMLPQSTAPGKSLVSLGVGHRGQSATAIGVSSMSNGKWVVKGGMSYDTQRH
ATFGGSVGGFFN

SEQ ID NO: 6 (*Haemophilus ducreyi*)

MKIKCLVAVVGLACSTITTTMAQQPPKFAVSSLYSEYDYDGKGTWSNEGGFDIKVPGIKMKPKEWISKQATYLELQHYMPYTPVLV
TSAPDVSPSSISILLYPMSDPQLGINRQQLKLNLYSYFNDLRHDFKLVLDARISKNKQNI DTISKYLLGLTYLDGSYRMMEQNTN
NINKNTHNINKNTHNINKLSKELQTGLANQSALSMLVQPNGVGKTSVSAVGGYRDKTALAIGVGSRI TDRTAKAGVAFNTYNGMS
YGASVGYEF

SEQ ID NO: 7 (*EPEC*)

MKTVNVALLALIISATSSPFVLGADTIEAAATELSAINSGMSQSEIEQKITRFLERTDNSPAAYTYLTHEHHYIPSETPDTTQTTPPVQT
DPDAGQKTVAATGDVQTTARYQSMINARQSTVTDAAQTQITEQQAQIVATQKTLAATGDTQNTAHYQEMINARLAAQNEANQRTTTEQ
GQKMNALTTDVAAQQQKERAQYDKQMQLAQKSVQAHEQIESLRQDSAQTQQQLTNTQKRVADNSQQINTLNNHFSSLKNEVEDNRKE
ANAGTASAIASQPQVKTGDLMVMSAGAGTFNGESAVSVGTSFNAGTHTVLKAGISADTQSDFGAGVGVGYSF

SEQ ID NO: 8 (EAEC)

MKTVKLSLLAVVAVATAVSPSAFAGDTVEAATTELTVIQPGMSQSEIDQKIGRFLERTGNSVAAQNYLIAHDYQTTTPQENTAASPVQP
 TNTLNPITNQAQOTDRDNGQDTAIQDAQHAANWASLKADDAQHAITVAQTDIDANTAAITDTRNDVSAVQSDVTNIKGDVAHAQSTADH
 ANANANTALINGVKLSGAVTENKNNIEQNRSDIADQQKLLASNEQKQIVRDNGQDTAIQDAQHAANWASLKADDAQHAITVAQTDIDA
 NKAAITDIRNDVSAVQSDVTNIKGDVAHAQSTADHANANANTALMNGVKLS SAVTENKNNIEQNRSDIADQQKLLASNEQKQIVRDNG
 QDTAIQDAQHAANWASMKADDAQHAITVAQTDIDANKAAIADTRNDVSAVQSDVTNIKGDVAHAQSTADHANANANTALINGVKLSGA
 VTENKNNIEQNRSDIADQQQLDETRKIVAATGDVQTAARYQSMIDARQTAANAQQAQADTQQQOMDDQKQIDATQKTVSALGDAQ
 TNAHYQEMVNAGLRAQNDANARTAAEQKQIDTLATNQATQQHINSVQYGEQIQRLAQDSTQTHEQIDSLTQDVTQTHQQLSNTQKRV
 ADNSQOITTLNNHFSSLKNEVEDNRKEANAGTASAIASQPQVKAGDFMMSAGAGTFNGESAVSVGTSFNAGTHTVIKAGVSADTQ
 SDFGAGVGVGYSF

SEQ ID NO: 9 (EAEC)

MNKIFKVIWNPATGSYTVASETAKSRGKSGRSKLLISALVAGGMLSSFGVQAQAGRDNGQGVNYGQGTGTGWVAIGEDAKANSFTDT
 GGSSTAVGYHSTADGRWSTALGAKTHSLGEASVALGINTTSAGERSLAIGASATSTGGFSIALGRYANSVGEFSIAQGDHAETGADD
 AIAFGRESKALGIMSIALGATANASKEYAMALGASSAASAANAIAVGRNSAAAGVDSLAFGRQSAASAANAIAAMGAESKAAENATAVG
 TNAEANGLSIALGSGSIADVDNTIALGNQSQAVAAGAIAGQGNKADGANAIALGNGSITGGVNAIALGQGSYAGLENGTAIGAQAS
 AQGKNSVALGAGSVATDADTVSVGNTTAQRQIVNMAAGDISTTSTDAINGSQLYAISKSVADNLGGGATVNAQGVVTSPPNYRLKSGIF
 GTVGDAITGLDNNTLQWDSLKKAYSAAHGDTTSTITNVKDGAI SDTSKDAVNGSQLKTTNDNVATNTANI TTNTNSINTLTDVSGDL
 KDDALLWNGTAFSAAHGTEATSKITNVKDGDLTAGSTDAVNGSQLKTTNDNVATNTNITNLTDVSGDLKDDALLWNGTAFSAAHGTD
 ATSKITNVKDGDLTAGSTDAVNGSQLKTTNDAVAANTTNIA TTTNITNLTDVDSLGDSSLWNATAGAFSAAHGTDATSKITNVTA
 GDLTAGSTDAVNGSQLKTTNDAVAANTTNIA TTTNITNLTDVDSLGDSSLWNATAGAFSAAHGTDATSKITNVKDGDLTAGSTDA
 VNGSQLKTTNDAVAANTTNIA TTTNITNLTDVDSLGDSSLWNATAGAFSAHGTNGTDSKITNLLAGTVSSDSTDAINGSQLYGL
 ADSFTSYLGGGADISDAGVLTGPTYTIGTDYNNVGDALAAINTSFSTSLGDALLWDATAKGGDGAFA SAGRGTNTASII TNVADGAI
 SSTSSDAINGSQLYDTSKYIADTLGGDAEVNADGTITAPT YAIAGGSYSNVGDALEAIDTTLDDALLWDATANDGNGAFSAAHGDKDT
 ASVITNVANGAISATSSDAINGSQLYTTNKYIADALGGDAEVNADGSITAPT YIANAEYNNVGDALDALLWDATANDGAGAY
 NASHDGKASII TNVADGNIGEGSTDAINGSQLFNTNMLIQNSEI INQLAGNTSETYIEDNGAGINYVRTNDNGLAFNDASASGIGAT
 AVGYNAVASGESSVAIQGSSSNVDTGIALGSSSVSSRVIVKSRDTSVSEEGVVI GYDTTDGELLGALSIGDDGKYRQI INVADGSE
 AHDVAVTVRQLQNAIGAVATTPTKYFPHANSTEEDSLAVGEDSLAMAKTIVNGNAGIGIGYAYVDANALNGIAIGSNARANHANSIAM
 GNGSQTTTGAQTGYAAYNMDAPQNSVGEFSVGESEDGQRQITNVAAGSADTDAVNVGQLKVTDAQVSQNTQSITNLNNQVTNLDRVTN
 IENGIGDIVTTGSTKYFKTNTDGDVANAQKDSVAIGSGSIAADNSVALGTGSVANEENTI SVGSSTNQRRITNVAAGVNATDAVNV
 SQLKSSEAGGVRYDTKADGSVDYSNITLGGGNGGTTTRISNVSAGVNNNDVAVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGG
 IASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMSVANGRWVYKLGSTNSQGEYSALGAGIQW

SEQ ID NO: 10 (UPEC)

MNKIFKVIWNPATGSYTVASETAKSRGKSGRSKLLISALVAGGLSSFGASADNYTGQPTDYGDGSAGDGWVAIGKGAKANTFMNTS
 GASTALGYDAIAEGEYSSAIGSKTLATGGASMAFGVSAMKMGDRSVALGASSVANGDRSMAFGRYAKTNGFTSLAIGDSSLADGEKTI
 ALGNTAKAYEIMSIALGDNANASKEYAMALGASSKAGGADSLAFGRKSTANSTGSLAIGADSSSSNDNAIAIGNKTQALGVNSMALGN
 ASQASGESSIALGNTSEASEQNAIALGQGSIAKVSNSIALGNSLSGGENAIALGEGSAAGGSNSLAFGSQSRANGNSVAIGVGAAA
 ATDNSVAIGAGSTTDASNTVSVGNSATKRKIVNMAAGAI SNTSTDAINGSQLYTISDSVAKRLGGGATVGS DGTVTAVSYALRSGYN
 NVGDALSGIDNNTLQWNKTAGAFSANHGANATNKITNVAKGTVSATSTDVVNGSQLYDLQDALLWNGTAFSAAHGTEATSKITNVTA
 GNLTAGSTDAVNGSQLKTTNDNVTTNTTNIATNTTNI TNLTDAVNGLGDDSLWNKAAGAFSAAHGTEATSKITNVTAGNLTAGSTDA
 VNGSQLKTTNDNVTTNTTNIATNTTNI TNLTDAVNGLGDDSLWNKTAGAFSAAHGTDATSKITNVTAGNLTAGSTDAVNGSQLKTTN
 DNVTTNTTNIATNTTNI TNLTDAVNGLGDDSLWNKTAGAFSAAHGTDATSKITNVKAGDLTAGSTDAVNGSQLKTTNDNVSTNTTNI
 TNLTDAVNGLGDDSLWNKTAGAFSAAHGTDATSKITNVKAGDLTAGSTDAVNGSQLKTTNDNVSTNTTNI TNLTDSVGLKDDSLW
 NKAAGAFSAAHGTEATSKITNLLAGKISSNSTDAINGSQLYGVADSFTSYLGGGADISDTGVLSGPTYTIGTDYTNVGDALAAINTS
 FSTSLGDALLWDATAGKFSAKHGINNAPSVIDVANGAVSSTSSDAINGSQLYGVSDYIADALGNAVNTDGSITPTPT YAIAGGSYN
 NVGDALEAIDTTLDDALLWDTTANGNGAFSAAHGDKDTASVITNVANGAVSATSNDAINGSQLYSTNKYIADALGGDAEVNADGTIT
 APTTYTIANTDYNNVGEALDALLDNNALLWDEDAGAYNASHDGNASKITNVAAGDLSTTSTDAVNGSQLNATNILVTQNSQMINQLAGNT
 SETYIEENGAGINYVRTNDNGLAFNDASASGIGATAVGYNAVASHASSVAIQDSISEVDTGIALGSSSVSSRVIVKTRNTSVSEEG
 VVI GYDTTDGELLGALSIGDDGKYRQI INVADGSEAHDAVTVRQLQNAIGAVATTPTKYFPHANSTAEDSLAVGEDSLAMAKTIVNGN
 AGIGIGLNTLVLADAINGIAIGSNARANHADS IAMGNGSQTTTGAQNTYAYNMDAPQNSVGEFSVGESEDGQRQITNVAAGSADTDAV
 NVGQLKVTDAQVSQNTQSITNLNTQVTNLDRVTNIENGIGDIVTTGSTKYFKTNTDGDADANAQKDSVAIGSGSIAADNSVALGTG
 SVADEENTISVGSSTNQRRITNVAAGVNATDAVNVSQLKSSEAGGVRYDTKADGSDYSNITLGGGNSGTTTRISNVSAGVNNNDVAVNY
 AQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMSVANGRWVYKLG
 STNSQGEYSALGAGIQW

SEQ ID NO: 11 (*Shigella flexneri*)

MTNLGEDALKWDKDNVFTAAHGTETTSKITNVKDGDLTTGSTDAVNGSQLKTTNDAVATNTTNIATNTTNISNLTETVTNLGEDALK
 WDKDNVFTAAHGNNTASKITNILDGTVTATSSDAINGSQLYDLSSNIATYFGGNASVNTDGVFTGPTYKIGETNYYNVGDALAAINS
 SFSTSLGDALLWDATAGKFSAKHGTNGDASVITDVADGEISDSSSDAVNGSQLHGVSSYVVDALGGGAENVADGTITAPTYYTIANADY
 DNVGDALNAIDTTPDDALLWDADAGENGAFSAAHGKDKTASVITNVANGAISAASSDAINGSQLYTTNKYIADALGGDAENVADGTIT
 APTYYTIANAEYNNVGDALDLDNALLWDKTANGGAGAYNASHDGKASIIITNVANGSISEDSTDAVNGSQLNATNMIEQNTQIINQL
 AGNTDATYIEENGAGINYVRTNDNDLAFNDASASGVGATAVGYNASGASSVAIGQNSSSTVDTGIALGSSSVSSRVIKGSRDTSV
 TENGVVIGYDPTDGGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNAIGAVATTPTKYFHANSTAEDSLAVGEDSLAMGAKTV
 VNGNAGIGIGLNTLVLADAINGIAIGSNARANHANSIAMNGSQTTTGAQTGYTAYNMDAPQNSVGEFSVSGSEDGQRQITNVAAGSAD
 TDAVNVGQLKVTDERVAQNTQSIITNINNQVTNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGVDAQAQKDSVAIGSGSIAAADNSVA
 LGTGSVAEEENTISVGSSTNQRRITNVAASVNATDAVNVSQLKSSEAGGVRYDTKADGSDIDYSNITLGGGNGSTTRISNVSAGVNNND
 AVNYAQLKQSAQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMVSANGRWVY
 KLGSTNSQGEYSALGAGIQW

SEQ ID NO: 12 (*Brucella melitensis*)

MSFFKKNISITAMGGLMLSLAVDAAKAEENVSQLPPVFVVFELVENQGLANIALIRPRVIAPDNNLRPGGIVSGIAGLLTLGQENRN
 LISENQVINNNNTAIGQNRSTISNNAKGVADNRAAIRQNSAAISALGQRVDGLQGQINSARKEARAGAANAALSGRLYDNRPGKVS
 IATGVGGFKGSTALAAGIGYTSKNENARYNVSVAYNEAGTSWNAGASFTLN

SEQ ID NO: 13 (*Brucella suis*)

MSFFKKNISITAMGGLMLSLAVDAAKAEENVSQLPPVFVVFELVENQGLANIALIRPRVIAPDNNLRPGGIVSGIAGLLTLGQENRN
 LISENQVINNNNTAIGQNSDRIDANAKGVADNRAAIGQNSGRIDANAKGVADNKAAGRNSGRIDANAKGVADNKAAGRNSGRIDT
 NAKGVADNRAAISQNRGRINANAAGVASNRAAIRQNSAAISALGQRVDGLQGQINSARKEARAGAANAALSGRLYDNRPGKVS
 VGGFKGSTALAAGIGYTSKNENARYNVSVAYNEAGTSWNAGASFTLN

SEQ ID NO: 14 (*Ralstonia solanacearum*)

MVFSAMPQYACAEMLLQNDPGTNCGSVGDAYAWARGDGYSGCKVGYEAAKNLAKGTAFGNSLGQLSPGTNILVYGSTLRAGMNDEVTP
 LDSMNI GGHLVDVWASGFGHGVDMNNSAIKNLADGTLSATSTEAVTGRQLNATNTNITNLQNSIKSISSASLVQQAAGKDITVAKD
 LDGDAVDFSGKKLSSTTFSRKLTVAGTSLSATSTDAVSGKQLYTTNQNLSSTTNQNLADTNKSLAETNKNVSATTTNITNLQNTIKN
 ISGGSAGLVQQAAGKDITVAKDLDEAVDFSGKKLSSTTFSRKLTVAGTSLSATSTDAVSGKQLYTTNQNLSSTTNQNLADTNKDLANTNTRL
 TTAEGNLSSTTITNLQNTIKNISGGSAGLVQQAAGKDITVAKDLDEAVDFSGKKLSSTTFSRKLTVAGTSLSATSTDAVSGR
 QLYTTNQNLSSTTNQNLADTNKSLAETNKNVSATTTNITNLQNTVNNISSGSAGLVQQAAGKDITVAKDLDEAVDFSGKKLSSTTF
 SRKLTVAGTSLSATSTDAVSGKQLYTTNQNLSSTTNQNLADTNKSLAETNKNVSATTTNITNLQNTVNNISSGSAGLVQQAAGKDIT
 VAKNLDGDAVDFSGKKLSSTTFSRKLTVAGTSLSATSTDAVSGKQLYTTNQNLSSTTNQNLADTNKDLANTNTRLTTAEGNLSSTTITNLQNT
 TIKNISGGSAGLVQQAAGKDITVAKDLDEAVDFSGKNLSSTTFSRKLTVAGTSLSATSTDAVSGKQLYTTNQNLSSTTNQNLADT
 NKSLAKTNNNVSATTTNITNLQNTVNNISSGSAGLVQQAAGKDITVAKDLDEAVDFSGKKLSSTTFSRKLTVAGTSLSATSTDA
 VSGKQLYATNQNVSKLSANVTVDVSDVTNIKNMTNTIVNGGGLKYFHANSTLDDAQAMGLESIAFGGAAVAAGMNSMAMGGNARAVAG
 NAVALGAGSVADRANTVSVGSAGKERQITNVAAGTADTDAVNVAQLKAAGIINGSGRTNATVTYGTNADGSADYGNVTLGGGNAPAGT
 AIHNVAAGTAETDAVNVRQMNAAIASVQKVSNTNDPMFAADGDRAVKRASAKGTHATAMGAAASAGGDQSVATGHNAQSGGSSVAMG
 ANAKATANHAVAVGSGSVANRANTMSVGSAGSERQITNVAAGVQGTDAVNVSQLSQAVYAAGVDLPAGTTARQYTDQIGMVRQGISQ
 VARGAYSGIAAATALTMPDQKGSIAIGIGSATYKGYQAVALGASARISHNLKAKMGVGSSEGTTVGMGASYQW

5 SEQ ID NO: 15 (*Sinorhizobium meliloti*)

MALGRQSVSAGSGSLAFNGSYANSNGSVAIGQSAYAANVRAIAIGGDDAFWREAEQTKAGGSQSIAMGVRARTKSLVVDPPDTVAN
 EADPGGASDAIAIGTDAQANGDRSLAIGRQNGAGNEQSIGIGAGNTATGKLSIGIGSSNVASGEQSLSLGAGNNALQOGSISIGTETT
 AGGLRSIAFGVRASKEANLDIPDDVAIDAIAIGTNTKANGDRSVSIGTGSQASSGAVSIGDAKAVGDKSVSIGTESWADGDESVS
 IGLVNNAGFEGNDRKGGQTSVSLGAFNQSPGIEAIAIGARNEANADRSIAIGSRAKTKAADPAQADGGARDAVAIGTDALANDDRSI
 SIGWNSSTSLNDSISIGTRATSGSAGDIMIGTSGTGSTSGQNNVALGVAASQVKGSSNIAIGDSAGGSREGDNNVAIGTNAGIQFS
 ESEHETAVRADLVSDAVSIGNEALASADEAIAIGTGAVASGLKSISIGVGNTVSGASSGAIGDPTDITGTGSYSLGNDNTIAADNAG
 TFGNDNTLADAADGSRVIGNNNIDVSDAFVLGNGADVTEVGGVALGSGSVSDTGADVAGYVPGGASTADQNAIEATQSTRGAVAVGN
 PDAETGVYRQITGVAAGTADSDAANVAQLKSVETIAKTGWKLTTDSGSDIGIGPGDELVLKGGDGNIVISNQILSNDVSDILADEIEV
 NRVTRDPDTGASTVLDENGLSFTTQDANGEDTALGPRVTAAGIQAAKITNVAAGEADTDAVNFSQLRQVETASGNTDQRAVKYDWT
 DANTNGVIDEGELNLDVTLAGGMGTRISNLAAPGALSAASTDAVNGSQLFGLRSRVSNVAVALGGGAAYDPVKDEWIAPKYTIGGTD
 YSNVGDALAAVGGTAGAGWSLSAQGANASNVAPGETVLDLRSBGDNI VVSKAETGDTVSFDLADDLDVSESITVGADPADPNAPTIVIT
 GGSIVIGSTMLGSLGLVITGGPSVTTDGDAGGMKVTNVANGTVAKDSKDAVNGGQLFDVVANATANGVGYDDKSKGTLTLEGANGTK
 ITNVAAGDLNANSTDAVNGSQLYATNVKVDRLDTEVKEIDSRVYIESFQGDLENAAYYDTDAAGKRLNTLTLEGGDPDKPVLIANVA
 KGVKATDAVNVGQLDESVAESKSYTDEKTEWAIQAAIYTDQVIETKVSANVNYAQQRFQQLSSEIGQVRSEARQAAAIGLAAASLRF
 DNEPGKLSVALGGGFWRSEGAALFAGAGYTSDEGRVRANLTGAAGGNVGVGAGLSITLN

SEQ ID NO: 16 (*Bradorhizobium japonicum*)

MRAFSGNAINGTNYAAVGSNNVAVGNNGAVVGSNGVTDNTAAFGSSIGIAGGNNAAVGSFSTVTGSNSAAVGSFNNVSGNNSGAF
GTGQNIIRGNGTFAIGDPNIVNGNNSLVFGDNNTVNGSNVAGRGDNIQLVGSNNTIAATSSAAGSSVFGSGNTVNATNAVVMGNNSTVS
GASSVAIGNGTAVTGINAIAAMGTGAGANFDNSVAIGSGATTTRANQVAVGTASSTYTMSGITSAASKAAQSGPTQLVTSDAAGNLATT
SLAGLGLASAGDINGINSQLAALNGRVDNLTRESRGGVALALAASSLQFDRPGKISVSGGFGNFQGGQSLAVGLGYSYSDAMRFNAA
FTAAQQGAIGVRAGASWTLN

SEQ ID NO: 17 (*Burkholderia fungorum*)

MNKTYRSVWNESTGTWVAASEHASARGKKSAKTSSTKAVVGALGLAAGLYGADAFALGGGLTLCPTEGSAGYTAGSASSANGAYCG
SDYQWGLFSNTNADGSKSGQPIGAAIEGMNDGSLLLYGPNNIVMKNLVSMSNKIINLAPGTVSSTSADAVNGSQLYATNQVNSNIGN
TVNNITTTAGIMYFHVNSTLADSTANGVNSIAIGGATRTDANNSISIGTGLTQASSNTGAIAGQNASINVYGANSIAIGTNSATGGI
GGAIALGENAFATGGKMLALGSGASATTANSVALGSGSTTTANLTAAGYNPGSGTLAGTSQATNGEVSVGNAGAERRITNVAAGSAAT
DAVNVSQLQSEDAKVNTINNNVNNLSGSVTNISSTVNNITNGGGIKYFHANSTQADSSATGTDAVAIGGNAQATAANSVALGLNSTSK
GTNAIALGGAVAGGSYAFAGSLALAATTGDIALGSSATASSANSNAYATALGTNALANATDATAIGEGASATAASSVALGARSKTTA
NLSTAGYNPGTGTLSGTTPTGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLMSEDAKVNTINNNVNNLSNNVTNIAGNVTNISNTVN
NITNGGGIKYFHVNSTLADSSAGGTNSIAIGGGATTGNVTAGTSDNISIGTNATTNYGKNIAIGGNAQALGGAYDGGYNTAIGENAIA
KGDGAGGFGGGWGQTTAIGGGSQALHDNTTAVGSGAIANVANATALGMSASATAGSAIALGQGAVASAANSVALGSGSTTTXNLSAA
GYNPGTGTLSGIASVANGEVSVGAAGKERRITNVAAGSAATDAVNVSQLQSEDAKVNTINNNVNNLSGSVTNISNTVNNITNGGGIKY
FHTKSTLADSSATGTDAVAIGGNAQATAANSVALGSNSTTTANLSAAGYNPGTGALSGIASAANGEVSVGAAGKERRITNVAAGSAAT
DAVNVSQLQSEDAKVNTISNNVNNLSGSVTNISSTVNNITNGGGIKYFHTNSTLADSTANGVNSIAIGGATRTDANNSISIGTGLTQA
SSNTGAIAGQNASINVYGANSIAIGTNSATGGIIGAIALGENAFATGGKMLALGSGASATTANSVALGSGSTTTANLTAAGYNPGSG
TLAGTSQATNGEVSVGNAGAERRITNVAAGSAATDAVNVSQLQSEDAKVNTINNNVNNLSNNVTNIAGNVTNISNTVNNITNGGGIKY
FHTKSTLADSSATGTDAVAIGGNAQATAANSVALGSNSTTTANLSAAGYNPGTGTLSGTTPTGEVSVGSAGKERRVTNVAAGSAATDA
VNVSQLQSAIIGSTANAVAYDDGKTATVTLKGASGKITNLTAGNLSATSTDAVNGSQLYATNQVNSNIGNTVNNITNGGGIKYFHAN
STQADSSATGSNSVAVGDRASSLGGSSVAMGDGATAVGAASIAIGNNAQNVTSNNSVAIGGDSKAGDRSVSLNGADTSLSSWGVAV
GTNANVSAALGTAIGAGANVSGANSTAIGANAVASATNSVALGSNSTTTANLSAAGYNPGTGTLSGIASAANGEVSVGAAGKERRVTN
VAAGSAATDAVNVSQLQSEDAKVNTINNNVNNLSGSVTNISSTVNNITNGSGIKYFHTNSTLADSSAGGANSIAIGGGAATSSAGLS
DNMAIGTNATASYGKNIAIGGGAQATGGTYDGGYNVALGENANATAGTNAWGHNTAIGANTVINGVNSVALGISATTSGSGSMAFGSA
AQASADYAIASGAGANASAVNSVALGSNSTTTANLSAAGYNPGTGTLSGIASVANGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLQ
SEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGGIKYFHANSTLADSSATGTDAVAIGGNAQATAANSVALGSNSTTTA
NLSAAGYNPGTGTLSGTTPVGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLQSAIIGSTANAVAYDDGKTATVTLKGASGKITNL
AGNLSATSTDAVNGSQLYATNQVNSVNGTVSNLSNNVTNIAGNVTNISNTVNNITNGGGIKYFHANSTLADSSATGTDAVAIGGNAQ
ATAANSVALGSNSTTTANLSAAGYNPGTGALSATTPVGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLMSEDAKVNTINNNVNNLSN
NVSNIAGNVTNISNTVNNITNGGSGIKYFHANSTLADSSATGVDAVAIGGNAQATAANSVALGSNSTTTANLSAAGYNPGTGALSGIA
SAANGEVSVGAAGKERRITNVAAGSAATDAVNVSQLQSEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGSGIKYFHANS
TLADSSATGTDAVAIGGNASASAANSVALGSNSTTTANLSAAGYNPGSALSGTASAANGEVSVGAAGKERRITNVAAGSAATDAVNV
SQLQSEDAKVNAEGAATAAALGGGSTYNTTTGATTSPTYIAGGKTFNNVGDVVTNIDGRVTQNSTDITNLTTTIDNGTIGLVQQAATPT
STITVAKDTGGATVDFRGTGNATRTLGTITAGELSATSTDAVNGSQLYATNQVNSNIDNTVSNLSNNVTNIAGNVTNISNTVNNITNG
GGGIKYFHANSTLADSSATGVDAVAIGGNAQATAANSVALGSNSTTTANLSAAGYNPGTGTLSGIASAANGEVSVGAAGKERRVTNVA
AGSAATDAVNVSQLQSEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGGGIKYFHANSTLADSSATGTNSLAAGPAAVAS
ATDAVALGNGAKATNAGAVAGAGSTTTTAVATSGTTIGGITYTFAGVAPSSVSVGAAGSERTITNVAAGRLSATSTDAVNGSELFA
TNQQVTRNTADITNLTNMNIIGSVGLVQODATRTITVAKATDGRVDFGTGGRQLTGVAAGAVNATSVDAVNGSQLYGVSVQSVAD
AIGGGSTVNTDGSISAPTYVVDGTTVHNAGDAISNLDNRVTQNTDITINNTLNSITTGAGVKYVHVNSTLADSLAKGAESVAIGGN
AQSQAANSVALGSNSVADRANTVSVGAAGAERQITNVAAGTADTDAVNVAQLKASGVINTDGTNAAVTYDHNADGSANYNSVTMGNG
VAGGTTIHNVAAGSAADDAVNVSQMNAAISSVSNIGSAGNPLFTADGNRDTEAAVASGTHATAMGANAKASAANSVALGANSVADRE
NTVSVGSAGNERQVTNVAAGTATDAVNVGQLNQAGASIGNLPAGMSAKDYTDQQINAVQNGVNQVAKNAYAGIAAATAALTMIPDVD
QKKTIAVGVGGGSYKGSQAVALGISARITQNLKMKAGAGTSSQGTTVGLGASYQW

SEQ ID NO: 18 (*EPEC*)

MLIQQNSEVINQLAGNTSETYIEENGASINYVRTNDTGLTFTDASAAGIGSTAVGYNTVAKGDNSVAMGYNSFAEGHSSVAIGQGSYS
GVETSIALGSESVSRRVIVKGSRNSTVSEEGVVIGYDTTDGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNAIGAVATPTPT
KYYHANSTAEDSLAVGEDSLAMAKTIVNGNAGIGLNTLVLADAINGIAIGSNARANHADSIAMGNGSQTTTGAQNTYATYNDAP
QNSVGEFVSGSEDGQRQITNVAAGSADTDAVNVGQLKVTDAQVSQNTQSIITNLNTQVTNLDRVTNIENGIGDIVTTGSTKYFKTNTD
GVDANAQOKDSVAIGSGSIAAADNSVALGTGSGVANEENTISVGSSTNQRRITNVAAGVNATDAVNVSQLKSSEAGGVRYDTKADGSID
YSNITLGGGNGGTTTRISNVSAGVNNNDAVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMAS
IGGGTYNGESAVALGSMVSANGRWVYKLQGSTNSQGEYSALGAGIQW

SEQ ID NO: 19

GSGGGG

SEQ ID NO: 20 (*Haemophilus aegyptius*)

GTACCGCAGAGCTGGCAAAAAGGCACGGCAGTCTCTTTGTGCGAAGCCCATGATTACAAGTTGCTAGGTAAAATCAAACGTTATAC
 TGAGGAAATTTAAAGGCACGCATTTTAGCAGGTTTAGAACCTCGCACTAAGCCACCAAAGATGGCGAAGTGAAATCTGTCAGCAAA
 AAACAAAAGGCGCGCATTAAGAAAAACGTGAAGATAAGAAAAAACAGAGGCAAAGAAAAAGTAAAATTGCGTCATAAGGATACAA
 AAAATATCGGCAACGACGCAAGCCAAGTAATAGTAATATTTAATTAGGTATGATGTAAATCTGCTTGAGGCAAATTTACATAGGA
 AATTTTCTATATTGCTTTAACGTTTTTTTATAGTAGAAGTATATACTCAGTTATGGTTATGGTTACATAGTATAGTTTACTTTGTT
 CTAGTTCACTTTAATAACCTTAATAAATTGAGGATTTCTTATGAAAAGAAATTTATTAACAATCTGTAATCGCTGTGTTGATAGGT
 GGCCTACTGTTTCTAATTATGCTTTAGCACACAGCACAGCACAAAGTCAAAAAAGATGAACCTAGTGAGTTAAGAAACAAG
 TAAAGGAAATGGATGCTGCTATCGATGGTATCTTGATGATAATATTGCTTATGAAGCTGAAGTTGATGCAAACTTGATCAGCATTC
 TGCTGCTCTTGGTAGACATACAAATAGACTCAATAATCTTAAACGATTGCAGAGAAAGCAAAGGTGATTCAAGTGAAGCACTTGAT
 AAAATTGAAGCTCTTGAAGAACAAAATGATGAGTTTTTAGCGGATATTACAGCTTTAGAAGAGGGAGTTGATGTTTATAGATGATGATA
 TCGCAGGTATTCAAGATAATATTTCTGATATAGAAGATGATATTAATCAAAATCTGCAGACATCGCAACTAACACAGCGGCAATCGC
 AACTCACACTCAACGCTCTTGATAATTTAGATAACAGAGTAAATAACCTTAATAAAGATCTTAAACGTTGGTCTTGCTGCTCAAGCTGCA
 TTAAATGGTTTTATTCCAACCGTATAACGTAGGTAAATTAATCTTACTGCTGCTGTAGGTGGTTATAAATCTCAAACCTGCAGTTGCTG
 TAGGTAC

SEQ ID NO: 21 (*Haemophilus somnus*)

ATGAAAAAGTACAATTTTTTAAATATTATCATTTGGCATTAGCATTGGGTTTAGGGGTAAGTGCTTCTGCTTTGGCAGCCCCAACAA
 GTACAAGTACGACTACTGGACCAGAGGCGCCTCTACAGGCCCTGCTCCTACGGCGAAAGACCCTCTAGCAGAAACAGCGTTAGCCTA
 TGATTTGGAGAACGAAGTTGCGTATCTTCGTATGAAGGCGGGTGAGTGGATGCAATTGGGGCTTGATCCTGAAAAAGAAGTCATCAA
 GGCTGGAATGAGGTAAATCTCTCCCTCGTATCGATGGAATGGAAGGATAAACAGACAAAAGATCAAATAGCAATGTTGATAAGAA
 CGGTTGATAATACAAAAGAGCTTGGTGGATCGTTAGTACAACATTTGAAGATATTAAGAACCCTAAAAAGAGCTTTACGGTTTTGT
 AGAAGATGTGAACGAGAGTGAAGCACGCAATATCTCAAGAATAGATGAGAATGAGAAAGATATTAAGAACCCTAAAAAGAGCTTTAC
 GATTTGTAGAAGATGTGAACGAGAGTGAAGCACGCAATATCTCAAGAATAGATGAAAATGAGAAGGACATTAATACTCTTAAAGAGC
 TAATGGATGAGGATTTAAATTCAGTCTTAACCCAAATTGAAGATGTAAACTCACATTTCAAGATGTCAATGATAACGTTAATTTGGC
 ATTTGAAGAGATTAATGGAATGCCAAAAGTTTGACACTGCTATTGAAGGACTTACTTCAGGTTTGAGCGATTTACAAGCTAAAGTC
 GATGCAATAAACAAGAACTGAAGACGATATTGCGGACAATGCCAAGGCTATTCATAGCAACACAAAAGGTATTGCTAAAAATACCA
 AGGATATTCTGACTTGGACACCAAAACCAAGCAATGTTGGAATGACAAAACTTGATGACCGGTTTAGAATCTTTAGCAACAGA
 AACAGCAAAGGCTTTGAAAGATTTGATGTCAAAACACAACAATTAGATCAAGCCGTCGCAATGTCTGCGTCGAGTAGACATAACT
 GACCAAGCTATTGCGCAAAACACTGCAGGCTTAGTCAATGTGAATAAACGTTGTCGATACACTCGACAAAACACCAAGCCGGTATCG
 CTTCTGCAGTCGCTTTAGGTATGTTGCCACAATCCACTGCTCCGGTAAATCATTAGTGAGCTTAGGTGTCTGCGTCATCACCCTGGGCA
 AAGTGCTACTGCTATTGGAGTATCTCTATGAGCAGTAACGGTAAATGGGTTGTTAAAGGCGGTATGAGCTATGATACACAGCGTCAT
 GCTACTTTCCGCGGTTCTGTCTGCTTTTCTTTAACTAA

SEQ ID NO: 22 (*Escherichia coli*)

ATGAAAAGTGTAAACGTAGCTTTACTGGCACTCATAATTTAGCAACATCCAGCCCTGTTGTTTTAGCTGGTGATACCATTGAAGCGG
 CGGCAACAGAGCTTTAGCCATTAACCTCTGGCATGTGCAATCGGAGATTGAGCAGAAGATTACCCGCTTTTTAGAACGCACAGACAA
 CAGCCCCGCTGCGTATACCTATTTGACTGAACATCACTACATCCCTTCTGAAACACCTGATACCACTCAGACTCCCACTGTCCAGACA
 GATCCTGACGCAGGACAAAAACCGTTGCCGCTACAGGTGATGTACAGACAACCTGCCGTTATCAGAGCATGATCAACGCCCGACAGT
 CTGCGGTAACGTAGCGCCAGCAAACGCAATTAACAGAGCAACAGGCGCAGATCGTAGCCACACAAAAACGCTCGCCGCGACTGGAGA
 TACGCAAAATACCGCGCATTATCAGGAAATGATTAATGCCAGACTGGCGGCTCAAAATGAGGCTAATCAGCGCACCGCCACTGAACAA
 GGGCAGAAAATGAATGCGCTGACAACCGATGTGGCAGTACAACAGCAAAATGAAAGGACTCAATACGATAAAACAAATGCAAGTCTGG
 CGCAGGAGTCTGCCAGGCACATGAACAAATTGACAGCCTGTCAAGACGTAACCCAAACGCACCAACAGTTAACCAACACCCAAAA
 ACGGGTTGCAGATAACAGCCAGCAAATTAACAGCTCAATAACCATTTAGTTCTGCTAAAAAACGAAGTTGATGACAATCGTAAAGAA
 GCCAATGCGGGAAGTGCATCTGCCATCGCTATCGCCTCACAACCACAGGTTAAACCGGTGACGTGATGATGGTGTGACGGGAGCGG
 GAACCTTCAACGGTGAATCTGCGGTGTCTGTGCGAACATCATTTAATGCCGGAACGCATACGGTACTTAAAGCCGGTATTTCTGCGGA
 TACACAATCTGATTTCCGCGCAGGTGTGCGCGTGGGATATTCGTTCTAA

5 SEQ ID NO: 23 (*Escherichia coli*)

ATCGCCAAACAGCGTCGGCGTCTGGGCGCAGTAAGAGACTTGCTGACGGTAGATTTCTGGCTTTAGTGTGCTGACATCCTCACCTTCA
 AACAGTAACGTTCCGCTGGTTGGGCTGATCAATGAAGCAACTATTTTAGCAGCGTACTTTTGCCACAACCAGAAGGACCGGTAATTA
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 CAAAGGACTATTTTCTGCATCGCTGTTCCCTTTTTCTGATTTTACTAAAAACAGTTTATCCTTCGCAGGAATAAGGGGGAAGTCTC
 TTTAGTAATCAGGTATAATTTGTTTAAATCAAGCAGCAATTTGCTGATTATGGACGGTACAACAGGAGGTTTTTCCGATGCTTATCT
 TTATCCCGATTCTCATTTTTGTGCGCTGGTCATTGTGCGCGCGGGCGTCAAAATCGTGCCGCGAGGGCTATCAATGGACGGTAGAACG

TTTTGGTCGCTATACCAAAACGTTACAGCCGGGGCTCAGTCTGGTGGTGCCGTTTATGGATCGCATTGGTCGCAAGATCAATATGATG
 GAGCAAGTGTCTGATATCCCTTCCCAGGAAGTTATCTCGAAAGATAACGCCAACGTTACCATCGACGCAGTCTGTTTTATTTCAGGTGA
 TTGACGCGCCACGCGCGGCTTATGAAGTCAGCAATCTGGAGCTGGCGATCATCAACCTGACCATGACTAACATCCGTACCGTGTTGGG
 TTCAATGGAAGTTACGAAATGCTCTCTCAGCGCGACAGCATCAACTCAGCCTGCTGCGTATTGTGATGAGGCCACCAACCCGTGG
 GGGATTAAAGTCACCCGTATTGAAATTCGCGACGTGCGCCACCGGCAGAGCTTATCTCTCAATGAACGCGCAGATGAAAGCGGAAC
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 CAGCGCCAACAGCGGACTCAGCCATGATGGAGTTAATAGTCGTTTATCCACATATTTTCTGGCTCAGTCTCGGCGGTTTGTCTGCTGG
 CAGCCGAGATGCTGGGCGGAAATGGTTATTGTGTGGAGTGGCGTGGCAGCAGTGATTACTGGCCTGGTGGTCTGGCTGGTGCCGCT
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 GCGCGGTATATGCGCGTCGGTGACAGTTTATGGCCTGTGAGCGCCAGCGAGGATCTCGGCGCAGGTACGCATGTTGAAGTCATTGC
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 CGTAGGCCCGCTCCGCCATGTTAAATGTTAACTGGCATTGGCAATTTACTCTTCCCGCCCTTTACTCATACTTTTTTGGTCTTTCATCC
 GGATAGTGTTTTTTAGATATTCCAGGACGTTTTTATTGACCTTGTGTTGCGTATACACCCACCCTTTCCAGTAATCAGGCTGGTCCA
 GGTAAACTTTTGGCGGAATGGTGAATCAGAAAGCGGTTAACTTACGCTGACGAGATCGGGGTTTCGTTTCTGTATCAACTGCAACAG
 CATAACTCAGCGACATGGCAGAGGAGGAGCGGTACTATCGCGCTTAAATACCTCCACACTGTCGACCGGTTTGAACGAAAAAGGATC
 GGTAGCAATGCCCGGTCCAGATTCAATTTTCAATTAATAATCTTCTCAAATTCATTCAATTTAAATTTTCTGCTGGCGTAAACCTCTTAA
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 GATGGTGTTTACGCTTACAACAGACAAAAATGCGCTTTACATCACACAAATGGCGCGTAGATTTTCGATTAAATTGCAACGCAGTTTA
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 CCATTAATCTGGCATGTGCAATCGGAGATTGAGCAGAAGATTACCCGCTTTTTAGAACGCACAGACAAACAGCCCGCTGCGTATAC
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 CCAGCAAAATTAACACGCTCAATAACCATTTTCACTTCGCTAAAAACGAGTTGATGACAATCGTAAAGAAGCCAATGCGGGAAGTGA
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 GTTCACCCACTTCCCGCATCGCAGATTGCCAGGCGCAGGCGCTCAGTCATGACACCTGTTACCTCGCAGAACAGCAGCGTCAGGCGGC
 TATTTTAAAGTGCATCCGAGGCACAGGCATTTAAAAATGCAAGCCGCACAACACGCCAGGCGGCAAGAAAGCCATTTATAAAGGA
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 TTTAAATGAAGGAGCAAGGAAAAATACCCCTGACGCATATTATGATTATCGGTGCGTTTATTTTTGCTTCTTGAAGTAGTATTAT
 TAGCCTCCCTGGTTACGCTGTGAATGTTAAACAAGCAATCCAGGAAGGCTTATTTTCACTCGGGGCGCATTATGGTAGAAAGTTTGCA
 GCATATTCTTTCCGGTGCAACCGGGATTCACTGATTTTCAACCCGCGCGATGATGACAGCAGCCGGAGAGATTTTCGATAATCGGGCA
 GTCGGCGCTGTATACCCGGGGCAGGCATTGCGCAGCGCCAGTAGCTGGTTGCGCATAGATTGCAGTTCTTCGATATGCCGTTCAATC
 TCCGCCACCTTCTCCAGCGTGCGACGTTTACGTCGGCACTGTGACGCTGCGGGTCTGTTAAACAGATTACCCAGCTCGCCGCTCTCTT
 CCAGGTTAAAGCCACCTGGCGCGCTGGCGCAGTAAGGTCAATTGCTTGAGATGCTGCTGCGTGTAGGTTTCGATAACCATTTTCGCT
 GCGCATCGGCGGCGTCACCGACCCCTTCTCTCATAGAAGCGAATGGCTTTGCTGGTCAGGCCGGTAATTTTGTCTACATCGCTAATG
 TTCATCGTTTCGCGCAACGCC

SEQ ID NO: 24 (EPEC)

ATGAAACTGTAAACGTAGCTTTACTGGCACTCATAATTTAGCAACATCCAGCCCTTTTGTGTTTAGCTGGTGATACCATTGAAGCGG
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 CAGCCCCGCTGCATATACCTATTTGACTGAACATCACTACATCCCTTCTGAAACACCTGATACCACTCAGACTCCCCCTGTCCAGACA
 GATCCTGACGCAGGACAAAAACCGTTGCCGCTACAGGTGATGTACAGACAACCGCCGTTATCAGAGCATGATCAACGCCCGACAGT
 CTACGGTAAGTATGCCCAGCAACGCAATTAACAGAGCAACAGGCGCAGATCGTAGCCACACAAAAACGCTCGCCGCGACTGGAGA

TACGCAAAATACCGCGCATTATCAGGAGATGATTAATGCCAGGCTGGCGGCTCAAAATGAGGCTAATCAGCGCACTACCACGGAACAA
 GGGCAGAAATGAATGCACTGACAACCGATGTGGCAGCACAAACAGCAAAAAGAAAGGGCTCAATACGATAAAACAAATGCAAAGTCTGG
 CGCAGAAGTCTGTCCAGGCACATGAGCAAATTGAAAGTCTGAGACAAGATTCCGCACAAACGCAGCAACAGTTAACCAACACCCAAAA
 ACGGGTTGCAGATAACAGCCAGCAAATTAACACGCTCAATAACCATTTTCAGTTTCGCTAAAAACGAAGTTGAGGACAATCGTAAAGAA
 GCCAATGCGGGAAGTGCATCTGCCATCGCTATCGCCTCACAAACACAGGTGAAAACCGGTGACTTGATGATGGTCTCAGCGGGAGCGG
 GAACCTTTAACGGTGAATCTGCGGTGTCTGTGCGAACATCTTTAATGCCGGAACGCATACGGTACTTAAAGCAGGTATTTCTGCGGA
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SEQ ID NO: 25 (EAEC)

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 GCCAACGCTAACGCCAACACCGCTCTGATTAACGGCGTCAAACCTTTCCGGTGTGTGACAGAAAACAAAACACATCGAACAGAACC
 GCAGCGATATTGCTGACCAGCAGAACTGTTGGCATCAAACGAGCAAAAACAGATCGTCCGCGACAACGGGCAGGATACCGCCATTCA
 GGACGCACAACATGCCGCCAACTGGGCTTCACTGAAAGCTGATGACGCGCAACACGCCATCACGGTGGCGCAGACGGATATTGATGCC
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 AGTCAACGGCTGACCATGCCAACGCTAACGCCAACACCGCTCTGATGAACGGCGTCAAACCTCTCTCTGCTGTGACAGAAAACAAAA
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 AGCTGACACCCAGCAGCAACAAATGGACGATCAGCAGAAACAAATCGACGCGACGCAAAAACGGTTTCCGCACTTGGCGATGCCAG
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 GCGGATAATAGCCAGCAGATTACTACGCTCAATAACCATTTTCAGTTTCGCTGAAAAACGAAGTTGAGGACAACCGTAAAGAAGCCAATG
 CGGGAAGTGCATCAGCCATCGCTATCGCCTCACAAACACAGGTGAAAGCCGGTGACTTTATGATGATGTGACGCGGAGCGGGAACCTT
 CAACGGTGAATCTGCGGTGTCTGTGCGAACATCTTTAATGCCGGAACGCATACCGTGATTAAAGCCGGTGTCTCTGCGGATACGCCAA
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SEQ ID NO: 26 (UPEC)

ATGAACAAAATATTTAAAGTTATCTGGAATCCGGCAACAGGCAGTTACACCGTTGCCAGCGAAACGGCGAAGAGCCGTGGTAAAAAAA
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 GGCGCGAGTACAGCTTTAGGATATGACGCGATAGCCGAAGGTGAGTACAGTTCTGCCATCGGGTCAAAAACCTTGCAACTGGTGGAG
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 GATGGCTTTTGGTCTGTACGCAAGACGAATGGTTTTACATCTCTTGCTATTGGGGACTCCTCCCTTCCGATGGTGAAAAAATATT
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 TGCTGACAGTAGCAGTTTGAACGATAACGCCATCGCGATAGGGAACAAAACGCAAGCCCTGGGAGTGAATTCGATGGCCCTGGGTAAT
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SEQ ID NO: 28 (EAEC)

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SEQ ID NO: 29 (*Burkholderia fungorum*)

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SEQ ID NO: 30 (EPEC)

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SEQ ID NO: 31 (Shigella)

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SEQ ID NO: 32 (*Brucella melitensis*)

ATGTCTTTTTTTAAAAAATATATCGATAACAGCCATGGGTGGCTTGATGTTGTCGCTTGCAGTCGACGCTGCGAAGGCGGAGGAAA
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SEQ ID NO: 33 (*Brucella suis*)

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SEQ ID NO: 34 (*Ralstonia solanacearum*)

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SEQ ID NO: 35 (*Sinorhizobium meliloti*)

[illegible]

TACAGCAATGTCGGCGACGCGCTGGCGGCGGTGGGCGGCACGGCCGGTGCCGGCTGGAGCCTCTCGGCGCAGGGTGCGAACGCGTCCA
 ATGTGCGCGCCGGGCGAGACGGTGATCTTCGACGCGGCGACGGCAATATCGTCGTGAGCAAGGCGGAGACCGGCGACACCGTGAGCTT
 CGACCTGGCCGACGATCTGGACGTCTCCGAAAGCATCACGGTGGGTGCCGATCCCGCCGATCCGAATGCGCCGACCACTGTTATCACC
 GGCGGTTCGATCGTGATCGGCAGCACCATGCTCGGCAGCAACGGCCTGGTCATCACCGGGGGGCGGAGCGTCACGACCGATGGCATCG
 ATGCCGGCGGCATGAAGGTACGAATGTGGCAAACGGTACGGTGGCGAAGGATTGGAAGGATGCCGTCAACGGCGGCGCAGCTCTTCGA
 CGTCGTTCGCAATCCCAATGCGCAATGGCGTCGGCTATGACGACAAAGCAAGGGCACCCGTGACGCTGGAGCGGGCTAACGGGACCAAG
 ATCACCATTCTCGCTCCGCTCCGCTGACCTGAACGCGAATCGCCCGACCGCTCAACGCGAGCCAGCTTTACGCCACGACCGTGAGCTTC
 ATCGGCTCGATACCGAAGTGAAGAGATCGACAGCCGCGTAACCTATATCGAGAGCTTCCAGGGCGATCTGGAGAACGCTGCCGTCTA
 TGATACCGACGCTGCCGGCAAGAGGCTCAACACGCTGACGCTCGAGGGAGGAGATCCCGACAAGCCGGTGCTCATCGCCAATGTGGCC
 AAGGGCGTGAAGGCGACCGACCGCGTCAATGTGCGCCAGCTCGACGAAAGCGTCCCGGAAAGCAAGAGCTACACGGACGAAAGACCG
 AGTGGGCGATCGATCAGGCGGCCATCTACACCGACAGGTTATCGAGACCAAGGTGAGCGCGGTGAACAATTATGCGCAACAACGGTT
 CGCGCAGCTCTCGGCGGAGATCGGGCAGGTTGAGGCGAAGCGCGGCAAGCCGCCGATCGGACTTGCGGCGGCGCTCGCTGCGCTTC
 GACAATGAGCCGGGCAAGCTGAGCGTGGCGCTCGGCGGCGGCTTCTGGAGAAGCGAAGGGGCGCTCGCTTCGGTGCCGGCTACACCA
 CGGAAGACGCGCGCTCCGGGCGAACCTGACCGGTGCTGCGGCCGGGGGGAACGTGGTGCGGTGCCGGCTCAGCATCACGCTCAA
 CTGA

SEQ ID NO: 36 (*Bradorhizobium japonicum*)

GTGCGGGCCTTCGGCTCCGGCAACGCCATCAACGGCACCACTACGCGGCCGTGGCTCCAACAACGTCGTGCGCGCAACAACGGCG
 CGGTTGTGCGCTCCGGCAACGGCGTCACCGGCGACAACACCGCGGCCCTTCGGCTCCAGTATCGGCATCGCCGGCGGCAACAACGGCGC
 TGTGCGCTCCTTCAGCACCGTCACCGGCGAGCAACAGCGCGGCTGTTGGCTCCTTCAACAACGTCAGCGGCAATAACAGCGCGCCCTT
 GGCACCGGACAGAACATCCGCGGTAACGGCACGTTGCGCATCGCGGATCCCAACATCGTCAACGGCAACAACAGTTTGGTGTTGCGCG
 ACAACAACACGGTGAACGGGTCCAATGTGGCGGGTTCGCGGCGACAACATCCAGTGGTTCGGCTCGAACAACACCATTGCGGCAACGTC
 CAGCGCCCGCGGCTCATCCGTGTTCGGCAGCGGCAACACCGTCAACGCCACCAATGCCGTGGTGATGGGCAACAACAGCACCGTCTCC
 GCGCGCTCCTCTGTCGCGATCGGCAATGGCACGGCCGTTACCGGCATCAACGCGATCGCGATGGGCACCGGCGCGGCGCGAATTTG
 ACAACTCGGTGCGGATCGGCAGCGGCGCGACACGACGCGCGCAACAGGTGCGAGTGGGACCGCCAGCAGCACTACACGATGAG
 CGGCATCACCTCGGCTGCGAGCAAGGCGGCGCGAGTCCGGACCGACCCAGCTCGTCACATCGGACGCGGCGGCAATCTGGCGACCA
 TCGCTGGCTGGCTCGGACTTGCCCTCCGCGGCGGACATCAACGGAATCAACTCCCAACTGGCCGCGCTCAACGGCGCGCTCGACAACC
 TGACACGGGAGTTCGCGCGGCGGCGTGGCGTTGGCGCTCGCGGCGTCCAGCCTGCAATTCGATCCTCGCCCCGGGCAAGATCTCGGTCTC
 CGGCGGCTTCGGCAATTTCCAGGACAATCCGGCTCGCGGTGCGGCTCGGCTATTCTATTTCGGACGCCATGCGCTTCAACGCGGCG
 TTCACGGCCGACAGCAAGGCGCCATCGGCGTCAGGGCCGGCGCGTCTGGACGCTGAAGTGA

SEQ ID NO: 37 (*NadA*)

MSMKHFPSKVLTTAILATFCGALAATSDDDVKKAATVAIVAAYNNGQINGFKAGETIYDIGEDGTITQKDATAADVEADDFKGLGL
 KKVVTNLTKTVNENKQNVDAKVKAASEIEKLTKLADTDAALADTDAALDETTNALNLGENITFAEETKTNIKIDKLEAVADT
 VDKHAEAFNDIADSLDETNTKADEAVKTANEAKQTAEETKQNVDAKVKAETAAGKAEAAAGTANTAADKAEVAAKVTDIKADIATN
 KADIAKNSARIDSLDKNVANLRKETRQGLAEQAALSGLFQPYNVGRFNVTAAVGGYKSESAVAIGTGFRFTENFAAKAGVAVGTSSGS
 SAAYHVGVNVEW

SEQ ID NO: 38 (*YadA*)

MTKDFKISVSAALISALFSSPYAFADDYDGIPNLTAQVQISPNADPALGLEYPVRPPVPGAGGLNASAKGIHSIAIGATAEAAKGAAVA
 VGAGSIATGVNSVAIGPLSKALGDSAVTYGAASTAQKDGVAIGARASTSDTGAVGVFNSKADAKNSVAIGHSSHVAANHGYSTIAIGDR
 SKTDRENSVSIHESLNRLTHLAAGTKDTDVNVAQLKKEIEKTQENTNKRSaelIANANAYADNKSSSVLGIANNYTDSKSAETLE
 NARKEAFAQSKDVINNAKCHNSVARTTLETAEEHANSVARTTLETAEEHANKEBAEALASANYVADSKSSHTLXTANSYTDVTVSNS
 TKKAIRESNQYTDKKEKQEDTRVDKGLASSHTLNLQKGVGVNNTAGTGSYRBSALAEIGSGYRVNENVALKAGVAYA
 GSSDVMYNASENTW

SEQ ID NO: 39 (*Consensus*)

MXMXKXXKXXLLAXAIXAXFSXGALAAXTDXXXTGPEAXXVXIXPAXXXLXXXXXXXXXXXXXXXXGLXAXAXXXSSXADAEAXVFK
 GLXXXXXXXXPNIXTXXXXXQTKDQIAMLIRXXXNLXENKXXVXXVAAIKXIPKDLIAKXADVXXXXVXXAXXRTXAXNNLKSCHS
 SHVAANHGYSTIAIGDRSKTDRENSVSIHESLNRLXXXAXKXKEEXXENIAQIDXNXEQXXEXXDKXXEXXNXXXXLAXXXXXAXX
 XAXXVNLXXXXXXXXXXXXTXXNLXQKIAEXKXNDAXKXKAXXXXXXXXXXXXXXXXXXAXNTKDXLXLTXXDXXXNSAXXAA
 XTXXIATEXSSXFEXXXKXXQXXQXIANNXTXVAIXEQXIXXNTARIDXLDRNVNLDKEXKAGLASQAALSGLFQPYNVGKLNVS
 AVGGYXSSXAXAIGXGSXRFNENXAAKAGVAXDTQXGGSSAGYXVGVNFEW

5 SEQ ID NO: 40 (primer)

TATCGGCAAACGACGCAAGC

SEQ ID NO: 41 (primer)

GGGCGATTAGCCATTGATAC

SEQ ID NO: 42 (primer)

AACGGTTGATGCCGCACTAG

SEQ ID NO: 43 (primer)

GTGTTGATAGGTGGCACTACTG

SEQ ID NO: 44 (primer)

GCGAGGAAAGCAAAGGTGATTC

SEQ ID NO: 45 (primer)

CAAAATTCCTCCAGACATCGCAAC

5 SEQ ID NO: 46 (primer)

CAAACGTCAGTTGCTGTAGG

SEQ ID NO: 47 (primer)

ACCTACAGCAACTGCAGTTTG

SEQ ID NO: 48 (primer)

CAACTCCCTCTTCTAAAGCTG

SEQ ID NO: 49 (primer)

AGTAGTGCCACCTATCAACAC

SEQ ID NO: 50 (HsdA)

CGACGCAAGCCAAGTAATAGTAATATTTAATTAGGTATGATGTAAATTCTGCTTGAGGCAAATTTTACATAGGAAATTTTCTATATT
 GCTTTAACGTTTTTTTATAGTAGAAGTATATACTCAGTTATGGTTATGGTTACATAGTATAGTTTTACTTTGTTCTAGTTCACTTTAA
 TAACCTTAAATAATTGAGGATTTCTTATGAAAAGAAATTTATTAACAATCTGTAATCGCTGTGTTGATAGGTGGCACTACTGTTTC
 TAATTATGCTTTAGCACAAAGCACAAGCACAAGCACAAGTCAAAAAAGATGAACCTTAGTGAGTTAAAGAAACAAGTAAAGGAAATGGAT
 GCTGCTATCGATGGTATTCTTGATGATAATATTGCTTATGAAGCTGAAGTTGATGCAAACTTGATCAGCATTCTGCTGCTCTTGCTA
 GACATACAAATAGACTCAATAATCTTAAACGATTGCAGAGAAAGCAAAGGTGATTCAAGTGAAGCACTTGATAAAATTTGAAGCTCT
 TGAAGAACAAATGATGAGTTTTAGCGGATATTACAGCTTTAGAAGAGGGAGTTGATGGTTTAGATGATGATATCACAGGTATTCAA
 GATAATATTTCTGATATAGAAGATGATATTAATCAAAATCTGCAGACATTGCAACTAACACAGCGGCAATCGCAACTCACACTCAAC
 GTCTTGATAATTTAGATAACAGAGTAAATAACCTTAATAAAGATCTTAAACGTGGTCTTGCTGCTCAAGCTGCATTAAATGGTTTATT
 CCAACCGTATAACGTAGGTAAATTAATCTTACTGCTGCTGTAGGTGGTTATAAATCTCAAACGCACTTGCTGTAGGTACTGGTTAT
 CGTTATAACGAAATATCGCGGCTAAAGCAGGTGTGCTTTCACTCATGGTGGCAGCGCAACTTATAATGTTGGCGTAAATTTTGAAT
 GGTAATTAGATAACTAATTTTCCATAACAGAAATAAATACCTGTTTTTGTAGTAATATCAGAAACAGGTATTTTTTTATAGGCTTCGT
 TTCGCACACTCGTTACTAGTGTGGATATGTGAATAAATCAATAATATTTGGAGTATTCATCTATTTTATTAATTTTGTAGCGGAT
 AAAATAACTTTCTGTGTGTTCCCTCCAAATCTTTAAATTCATAAACCCCTAATCGTTCATAAACGAGCTGGCATCATATTTTTTGC
 TTCAACGACTAAATTTGATAGCAGCTACCGTAGCATTCTTAATCTTATGAATGGCGTCTGCAATTAGAAACTTTCCATACCCCTTGCTTC
 TGGAAATTCGTATCAATGG

10 SEQ ID NO: 51 (HsdA)

MKRNLKQSVIAVLIGGTTVSNYALQAQAQAQVKKDELSELKKQVKEMDAAIDGILDDNIAEAEVDAKLDQHSALGRHTNRLNNL
 KTIAEKAKGDSSEALDKIFALFEQNDFFLADITALEEGVDGLDDITGIQDNISDIEDDINQNSADIATNTAAIATHTQRLDNLNDRV
 NNCHKDHRRS-AAQAALNGLFQPYRUGK-NTLWAVGGYKSGTWAVGTCYRYNENIAAKAGVATTHCGSAFYNNVLA-AT

SEQ ID NO: 52 (HsdA C-terminal)

TGYRYNENIAAKAGVATTHGGSATYNVGVNFEW

SEQ ID NO: 53 (Gene downstream of HsdA)

ATGATAAATGAAAATTTAGCATATTTAAGTGTATTACCCTTAGAAGATGTAAAGATTGAGAGAAGTTCATTTTCTTGTTCAGTTGAAC
 CTTTAGAAAACCTACTTTTCATAAGTACGTTTCTCAAGATGTAAAGAAAGGGCTTGCAAAGTGTTTTGTGCTTATAAATGCACAACCATC
 TAGGATTGTTGGCTATTACACTTTATCGGCATTATCAATACCAATTCCAGATATACCCCAAGAACGAATAAGTAAAGGCGTACCATAT
 CCTAATATTCCTGCTGTTTTAATAGGGCGATTAGCCATTGATACGAATTTCCAGAAGCAAGGGTATGGAAAGTTTCTAATTGCAGACG
 CCATTCAATAAGATTAGAATGCTACGGTAGCTGCTACAATTTTAGTCGTTGAAGCAAAAAATGATGATGCCAGCTCGTTTTATGAACG
 ATTAGGGTTATTGAATTTAAAGAATTTGGAGGAACACACAGAAAGTTATTTTATCCGCTAACAAAATTAATAAAATAG

SEQ ID NO: 54 (Sequence encoded by SEQ ID NO: 53)

MINENLAYLSVLPLEDVKIERSSSFCSVEPLENYFHKYVSQDVKKGLAKCFVLINAQPSRIVGYTSLALSIPIDIPQERISKGV
 PNIPAVLIGRLAIDTNFQKQGYGKFLIADAIHKIKNATVAATILVVEAKNDDASSFYERLGFIEFKEFGGTHRKLFLYPLTKLIK

SEQ ID NO: 55 (Histone acetyltransferase)

MINENLAYLSVLPLEDVKIERSSFSCSVEPLENYFHKYVSQDVKKGLAKCFVLINAQPSRIVGYTSLALSIPIDIPQERISKGV
 PNIPAVLIGRLAIDTNFQKQGYGKFLIADAIHKIKNATVAATILVVEAKNDDASSFYERLGFIEFKEFGGTHRKLFLYPLT

SEQ ID NO: 56

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGCAATGTGGGTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAAGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCACCTAGTG

SEQ ID NO: 57

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGCAATGTGGGTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAAGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCACCTAGTG

SEQ ID NO: 58

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGCAATGTGGGTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAAGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCGCCTAGTG

5 SEQ ID NO: 59

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGCAATGCGGGTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAAGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCGCCTAGTG

SEQ ID NO: 60

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGCAATGCGGGTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAAGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCGCCTAGTG

SEQ ID NO: 61

GCAAGCCAAGTAACAGTAATGTTTAATTAGGTATGATTAAATTCTGTTTATATCACACTAGAAATGAGGATTTCTTGTATTGGTAT
 TAACTAAATTACGCATTAATAAGGCGTAATTTAAGTTAATATCTTGTTGGTACATTTAAGAATACAAAATGCCCATCGCCTAGTG

SEQ ID NO: 62

TTAGGTATGATTAAATTCTG

SEQ ID NO: 63

ATAGTATAGTTTACTTTGTTCTAGTTCACTTTAATAACCTTAAATAATTGAGGATTTCTTATGAAAAGAAATTTAT

10 SEQ ID NO: 64

CCGACGCAAGCCAAGTAATAGTAATATTAAATTAGGTATGATGTAAATTCTGCTTGAGGCAAATTTTACATAGGAAATTTTCTATAT
 TGCTTTAACGTTTTTTTATAGTAGAAGTATATACTCAGTTATGGTTATGGTTACATAGTATAGTTTACTTTGTTCTAGTTCACTTTA
 ATAACCTTAAATAATTGAGGATTTCTTATGAAAAGAAATTTATTAACAATCTGTAATCGCTGTGTTGATAGGTGGCACTACTGTTT
 CTAATTATGCTTTAGCACAAGCACAAGCACAAGCAC

SEQ ID NO: 65

AGGATACGAAAAATATCGGCAAACGACGCAAGCCAAGTAACAGTAATGTTTAGGCTTGATAGTATAGCTTTGCTTTGTTCTAGTTCA
 ATTTAATAATCTTAAATAATTAAGGATTTCTTATGAAAAAAATTTATAGGCTTCGTTTCGCACACTCGTTGCTAGTATAGATATGTG
 AATA